

PLANT RECORDS SYSTEM
SERVING AREA VALUE ENGINEERING
FOR RURAL SYSTEMS

CONTENTS

1. GENERAL
 2. ASSIGNMENT RECORDS
 3. DISCUSSION OF THE SYSTEM
 4. MULTI-PARTY APPLICATIONS
 5. SYSTEM LAYOUT
 6. THE COMPUTER
- EXHIBITS
- A. DETAIL MAP
 - B. CABLE SCHEMATIC
 - C. ONE-PARTY CABLE RECORD (FEEDER)
 - D. THE HOUSING ADDRESS SYSTEM
 - E. SAI RECORD (FEEDER)
 - F. SAI RECORD (DISTRIBUTION)
 - G. LINE EQUIPMENT RECORD
 - H. TERMINAL RECORD
 - J. LINE AND STATION CARD
 - K. SERVICE ORDER
 - L. LINE TREATMENT RECORD
 - M. CARRIER/CONCENTRATOR RECORD
 - N. BLOCK DIAGRAM - SYSTEM LAYOUT
 - O. BLOCK DIAGRAM - SYSTEM LAYOUT (incl. line treatment)

1. GENERAL

1.1 This section provides REA borrowers, consulting engineers and other interested parties with technical information covering an operational record system for the Serving Area Value Engineering design of rural telephone plant. In particular, it covers the following:

(1) The serving area concept as compared with conventional plant design sometimes also identified as "Ready Access" or "Random Taper" designs;

(2) The establishment of the serving area and the introduction of the serving area interface (SAI);

(3) The consolidation of the interconnecting point (SAI) with the record activity at controlled points, thereby providing an orderly cross-connect point for station connects, disconnects and test purposes;

(4) The introduction through SAVE of subscriber carrier and other pair gain equipment with less record requirements, and;

(5) Numbering plans for use on feeder and distribution cables and identification of customer locations using the map and grid system. Along with

these discussions, a complete set of operational records are presented as one possible way in which the SAVE concept of cable plant design can be recorded. A short discussion is included about possible computer application to the system. The engineer will find additional helpful design and application information on the SAVE system in the following REA TEX CM Sections:

<u>TEX CM Section & Addenda</u>	<u>Title</u>
230	General Principles of Serving Value Engineering
231	Design Techniques for Serving Area Value Engineering
232	Transmission Design Considerations for Serving Area Value Engineering
629	Cable Plant Layout for SAVE
648	Serving Area Value Engineering (Physical Plant)

The serving area concept differs from conventional plant design in that basically a hard wire circuit is no longer necessarily "dedicated" from the MDF to the customer premise. Comments relating to the objectives and advantages of SAVE are thoroughly discussed in TEX CM Section 230. In addition, serving area design concepts, the establishment of serving areas and design strategy is also covered in detail in that section.

1.2 It is the purpose of this manual to offer guidelines in preparing plant facility records for the SAVE design of cable plant. This set of records has been formulated for the ultimate one party service; however, the same general information applies to the multi-party service as will be discussed later. The examples offered in this section of the manual comprise a complete and workable system of records. It is not the intent of REA, however, to dictate the format that a given company should use. Our objective is to point out the requirements of the SAVE record system and to offer guidelines in dealing with these requirements.

1.3 It is the position of REA that the best record system is one which incorporates daily operational needs and provides the necessary ease and flexibility for plant additions, rearrangements, etc.

1.4 There are certain criteria needed in the orderly numbering and recording of plant and customer information. These needs are dealt with in this section of the manual. The exhibit(s) provide at least one way of implementing this criteria. First and of utmost importance, the design engineer should cooperate totally with the operating personnel during plant assignments. These assignments, including future SAI points and the prededication of feeder pairs, should be made for the longest practicable time and with the objective of making only minimal modifications to the original engineering design in the future. Secondly, it is imperative that the telephone company faithfully maintain the integrity of the assignments. Thirdly, and of equal importance, the installer-repairperson (IR) should make no change in the assignments without an engineering work order so that the long range integrity of the system can be assured. In this manner, all plant records can be properly posted to reflect the changes. It should be obvious that when carrier systems or concentrators are put into use, and when multi-party assignments are made, this has the effect of multiplying the number of entries normally required in the records. Accordingly, maintenance of and correct entries into the records become increasingly important. This point cannot be over emphasized.

2. ASSIGNMENT RECORDS

2.1 There are several functions of the assignment records, and each of these are dependent, to some extent, on the other. First, the record should show the "location of the plant." Roads, streams, lakes, subdivisions, houses, etc. should be shown and preferably drawn to scale. Second, the record should show "what is there." The cables should be identified and information about each individual pair such as where it originates, where it terminates, where it is loaded and how it is identified should be part of the record. Third, the record should show "how the facility that is there is being used." For instance, what central office equipment units are connected to each working cable pair at the CO end; what feeder pairs are connected to what distribution pair at the SAI; what pair gain devices are being used and what is the direction for each working pair, are examples. Fourth, without the first three, the person responsible for line assignments would not be able to perform the last function of the record system, that is, "to assign pairs for new service, for changes, or for rearrangements." Note reference made to various exhibits in this section are supported actual assignments.

3. DISCUSSION OF THE SYSTEM

3.1 The following is a list and a general discussion of the supporting documents that comprise the complete one-party system for the SAVE cable design. It is assumed that the principal

SAVE have been applied to this system and that the design is, in fact, completed. It may develop, in subsequent discussions, that combinations of design circumstances, to fit any individual situation, will not occur, and thus the records will not be totally comprehensive. It is intended, however, that these examples will be general enough that the principles will have wide application. The following comprise the record system under discussion:

1. Detail Map
2. Cable Schematic
3. The Primary Numbering Plan (MDF-Feeder)
4. The Secondary Numbering Plan (Distribution)
5. SAI Cross-Connect Record
6. The Customer Numbering Plan
7. Central Office Equipment Facility Records
8. Line and Station Card
9. Service Order
10. Supplemental Records
 - a. Carrier/Concentrator Record
 - b. Line Treatment Record

It should be understood that certain of the above examples will be shown to function better as construction records, others normally will function better as operational records while still others may serve a dual purpose. Keep in mind, however, that the primary intent of this section of the manual is to discuss a set of operational records developed to serve the day-to-day needs of the telephone company after the plant is cut over.

3.11 The Detail Map: The detail map functions in several ways. Street and subdivision information are included for one key purpose -- ease of plant location. Existing and potential residential, business, mobile home and other customer locations are also readily determined. Route numbering and SAI points are shown which tie in with the cable schematic. The same is true for wire and cable types and sizes. Existing and future serving areas can be included on this map. Existing and proposed plant can also be shown here. The detail map is attached as Exhibit A.

3.12 The Cable Schematic: The schematic could normally cover one or more serving areas, as can the detail map. Much essential information is found on the schematic that may or may not normally be found elsewhere in the record system. This depends of course upon the individual record system that is selected. (It is of interest here, in helping reduce the complexity of the entire record system, that a good deal of information appear on the schematic.) In addition to the physical layout of the cables, other information that is available or could be included is loading, cleared and capped pairs, pair counts, cable size, footages, carrier and concentrator terminals and locations, field mounted VFR's, customer number and

pair assignments, drop points, route numbering systems, housing sizes and types, transmission zone information, etc. Also, provisions could be included to show future serving areas, pre-dedicated pairs to the SAI's, etc. In some cases, it may be convenient to include the information contained on both the detail map and cable schematic on one form. This should be an individual judgement of course, depending on the needs of the telephone company, its engineer, the system complexity, etc. The cable schematic is attached as Exhibit B.

3.13 The Primary Numbering Plan (One Party Record) - Feeder: This plan establishes the MDF count by way of the cable schematic in this example and shows the routing, loading, pedestals, poles, SAI points and other pertinent information.

3.131 The single party cable record is used to record this count, customer assignment information for dedicated plant, and the count that appears as feeder pairs in each SAI. This record is attached as Exhibit C.

3.14 The Secondary Numbering Plan (SAI Cable Record) - Feeder/Distribution: This plan establishes an orderly numbering of the distribution count and may be somewhat repetitious at each SAI but in every case must be different from the primary count. For instance, we are on the primary cable route and cable designated "1" from the MDF enters the SAI designated "A". Leaving the SAI, there are four different distribution sheaths. We might number them DL1 A1, DL1 A2, DL1 A3, etc. In this case, they could each number A1 through AX, as required. The symbols DL are only included to demonstrate numbering system flexibility.

In the case, where both feeder (primary count) and distribution pairs (secondary), leave an SAI under the same sheath, a different numbering system is required. For example, assume that a 300 pair cable is leaving the field side of an SAI. Also assume that 100 pairs are feeders continuing on to the next SAI and the other 200 pairs are for distribution. The first 100 pairs (feeders) will retain the identification and count of the cable as it entered the SAI from the CO, or cable 1, MDF count 601-700 (1, 601-700). As the cable leaves the SAI, it will now have the following identification: 1, 601-700 (feeders) and DL1 A1, 101-300 (distribution). This numbering system causes the first distribution pair to be on the first pair of the second hundred group in the cable and could be located at a customer pedestal with less chance for error than if a numbering system not addressing itself to the cable size were used.

3.141 In keeping with the idea that the SAVE design will defer a certain amount of plant investment by adding electronics rather than more cable, it is important that the design include expected future SAI points

and that the cable count intended for future feeders be assigned. In this manner, the expedient use of these pairs can be made so that when the future SAI is cut in, the field side of the feeders can be used as distribution pairs within the same serving area. The pedestal at that point should be an unequipped SAI housing.

3.142 The SAI record is used to show the location of the feeder pairs, the distribution pairs and auxiliary equipment (carrier, etc.), and to provide a way to cross reference the jumpering required to connect the customer to the COE. In this example, a single vertical, called frame 1 was used. Refer to Exhibit D for a sketch of how the housing address system is established. Twenty-five pair blocks numbered 1 to 18, top to bottom, were used along with the location of each pair called "BP" (Binding Post) on each block. In this case, blocks 1-3 were assigned feeder pairs and number frame 1, block 1, binding posts 1 through 25, frame 1, block 2, binding posts 1 through 25, etc. Block 4 was skipped for future use. Blocks 5 through 12 were assigned for distribution pairs numbering frame 1, block 5, binding posts 1 through 25 through frame 1, block 12, binding posts 1 through 25. Block 13 was assigned for carrier cross-connect assuming an external mounted station carrier.

The SAI records for purposes of examples in this section of the manual are Exhibits E (feeder) and F (distribution). Note that the "X to Dist BP and X to FDR BP" columns show the frame, block and binding post of the distribution pair that is assigned to a given feeder and vice versa. Also note that the "address" of a pair in this example is assigned by the identification: FRAME-BLOCK-BINDING POST, as Exhibit D explains. One method to account for high or low activity areas of the housing would be to prefix the above address with an appropriate symbol such as H, L, etc. In the case of a small low activity SAI, where blocks are not used, and conductors are hard wired, the cross-connect would simply show cable identifications and counts. In the case of station carrier or the use of concentrators, an auxiliary carrier/concentrator record is needed to show channel assignments and cross-connecting wiring. It may be that Exhibits E and F could be consolidated into one form. In any case, they should be laid out in such a way that would facilitate the easiest and quickest reference. For example, if the pages are laid out in book form, facing pages of records for comparable feeder and distribution count would be most convenient.

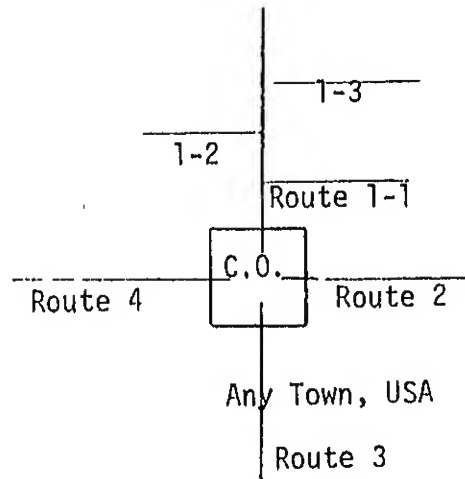
3.15 The Customer Numbering Plan: It is imperative that some logical numbering system be used to systematically number and locate the customer premises. In this example, we have chosen the MAP-GRID system in which the maps are keyed to townships, ranges and sections.

It is realized that parts of the United States do not use a system keyed in this manner. By using the central office as a key, however, a quadrant system could be superimposed on the map. A north-south and east-west line intersecting at the CO could identify the quadrant boundaries. Sections of the appropriate size to fit the map scale can be superimposed to the extent needed to cover the given exchange. These sections

would then be numbered. By using a suitably sized grid finder, the location of a customer could then be given the proper numerical assignment within this section. A customer map number might be quadrant A, section 21, location 6, or A-21-6.

3.151 Aside from giving a systematic approach to customer numbering, the MAP-GRID system allows the central recording point or consulting engineer to keep maps up-to-date by adding customers to a map from numerical assignments in the same geographical location as is found in the field.

3.152 As far as the cable routing information is concerned, the system of route numbers beginning with 1 on the north side of the CO, thence going 2, 3, etc., clockwise, is convenient. Sub-routes are numbered numerically from the main north-south, east-west lines depending on their establishment, distancewise, from the CO. The route numbering system is pictorially described as follows:



There are as many ways in which geographical customer numbering can be accomplished as there are for route numbering systems. For instance, Telephone Engineering and Construction Manual Section 116 could be referenced as another example of a route numbering system that is in current use. The route numbering system shown above fits in nicely with the MAP-GRID system discussed above for customer numbering, and thus is used here as an example.

3.153 It is not the purpose of this discussion to dictate what customer and route numbering plan must be used but to point out the importance of such plans. To simply number the customers or routes for

purposes of construction is not enough. The system must be logical, systematic and tabulated in such a way that the telephone company can carry out the assignments during normal operations.

3.16 Central Office Equipment Facility Records: The central office facility records can pretty much be used in the same format as they have been in the past. The increased number of stations and carrier systems will require records to facilitate maintenance. Also, with fine gauge cable, long line treatment will be expanded and a record of individual line treatment will be needed. Treatment on a CMO or CCO/G basis will be hard wired to the CO and not be made a part of the daily plant records. Examples of COE Facility Records' applications are attached as Exhibits G and H.

3.17 Line and Station Card: The line and station card has been expanded to show both the feeder and distribution assignments. This is important for maintenance. The card also contains space for the loop check method of testing. From a maintenance standpoint, this is an economical and effective test of the performance quality of a line. Other features that the card provides is space for recording data on customer owned equipment, on and off premise extensions, etc. The line and station card is attached as Exhibit J.

3.18 The Service Order: The plant copy of the service order is attached as Exhibit K. This form is basically discussed in REA Telephone Operations Manual Section 1440. For purposes of the SAVE concept, the service order has been expanded to include additional information. Provisions have been made to include MDF cable count, and address, the SAI identification, like information for the distribution cable and clarified details on the service location for the customer. Loading information includes the total of load points from the CO to the customer's residence.

3.19 Supplementary Records

3.191 Line Treatment Record: This record will function when either a loop extender or voice frequency repeater is used. The MDF cable pair will cross index to other appropriate forms such as the SAI and one-party record. Line equipment and terminal records can also be tied in with the line treatment. The line treatment record is attached as Exhibit L.

3.192 Carrier/Concentrator Record: An example of how to record the application of grouped, or distributed carrier is shown on the carrier records, Exhibits M1 and M2. The application of concentrators can be handled in somewhat the same manner. In order to reduce the quantity of cross-connect records, it is felt desirable to use hard wiring and tie cables wherever possible.

4. MULTI-PARTY APPLICATIONS

4.1 The SAVE concept is quite adaptable to multi-party service. As can be seen from the complexities of the one-party record system, the multi-party records will be more involved. It will be necessary to expand the cable assignment record, the SAI record and the carrier/concentrator record to provide space for accumulating customer information for all parties on a given pair or station carrier terminal. The line and station card will also need to be expanded in the same manner.

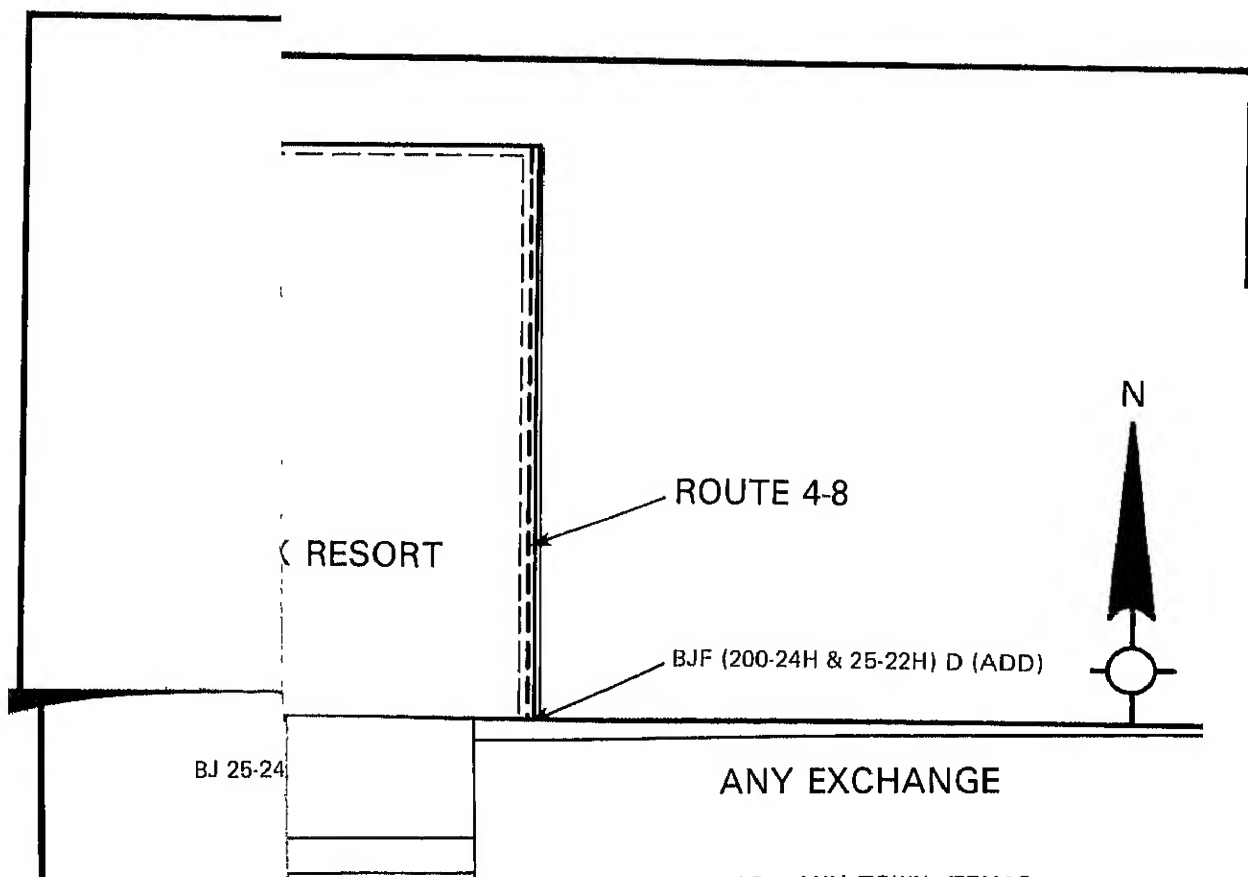
The cable and the SAI records perhaps could be restricted to map and telephone numbers in a directory type format using telephone number and map number as the key reference, followed by customer name, etc. The line and station card could be expanded to include multiple customers and be printed on both sides.

5. SYSTEM LAYOUT

5.1 System layout diagrams are attached as Exhibits K and O. It is the purpose of these diagrams to show typical interconnections in a telephone network, both with and without line treatment. These will be of assistance to the person preparing a set of records since various forms are referenced where entries should appear for any particular portion of a system.

6. THE COMPUTER

6.1 When the principles of SAVE are applied to plant design, it becomes necessary to expand record systems to accommodate the additional data entries that need to be made. This is an opportune time to consider the use of electronic data processing for keeping these records maintained and updated. Modifications resulting from SAVE that are made in record design, format, numbering systems, etc., should be carefully considered so that, if at some future time, the decision is made to use computer facilities, the changeover to such a system could be more easily facilitated.



ONE PARTY
CABLE RECORD

EXCHANGE Any
CABLE 1

MAP LINES
CABLE COUNT

EXCHANGE
CABLE

EXHIBIT C

Sheet 1 of 3



CA PAIR	LOOP OHMS	LINE & TERM	L P	CONN. NO.	MAP NO.	CUSTOMER NAME	CA PAIR	LOOP OHMS	LINE & TERM	L P	CONN. NO.	MAP NO.	CUSTOMER NAME
151							476						
52							477						
53							478						
54							479		392			12-5	
55							480						
56							481						
57							482						
58							483						
59							484						
60							485						
1							486						
2							487						
3							488						
4							489						
5							490						
6		457			12-7		491						
7							492						
8							493						
9							494						
10							495						
11							496						
12							497		382			12-4	
13							498						
14							499						
15	408				12-6		500						

MAP LINES R4-8 EXCHANGE Any
 CABLE COUNT 451-475 CABLE 1

MAP LINES R4-8 EXCHANGE Any
 CABLE COUNT 476-500 CABLE 1

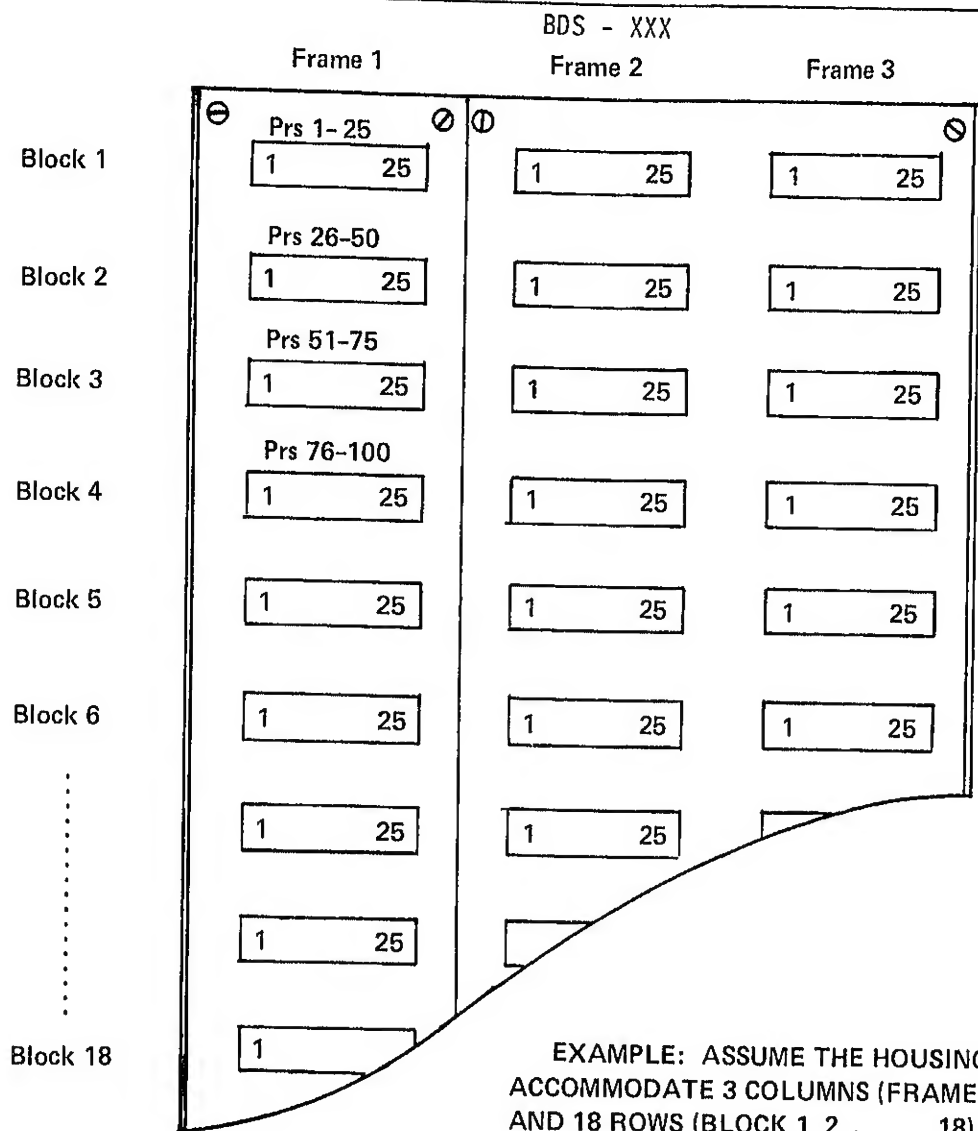
CABLE COUNT 501-525				CABLE 1				CABLE 1				CABLE 1			
MAP LINES 84-8				EXCHANGE Any				EXCHANGE Any				EXCHANGE Any			
LINE & TERM	LOOP OHMS	CONN. NO.	MAP NO.	CUSTOMER NAME	CA PAIR	LOOP OHMS	LINE & TERM	CONN. NO.	MAP NO.	CUSTOMER NAME	CA PAIR	LOOP OHMS	LINE & TERM	CONN. NO.	MAP NO.
1				See SAI X	526					See SAI X					
2					527										
3					528										
4					529										
5					530										
6					531										
7					532										
8					533										
9					534										
10					535										
11					536										
12					537										
13					538										
14					539										
15					540										
16					541										
17					542										
18					543										
19					544										
20					545										
21					546										
22					547										
23					548										
24					549										
25					550										

EXHIBIT C

CA PAIR	LOOP OHMS	LINE & TERM	L P	CONN. NO.	MAP NO.	CUSTOMER NAME	CA PAIR	LOOP OHMS	LINE & TERM	L P	CONN NO	MAP NO	CUSTOMER NAME
51						See SAI X	576						See SAI X
52							577						
53							578						
54							579						
55							580						
56							581						
57							582						
58							583						
59							584						
50							585						
51							586						
52							587						
53							588						
54							589						
55							590						
56							591						
57							592						
58							593						
59							594						
50							595						
51							596						
52							597						
53							598						
54							599						
55							600						

MAP LINES R4-8 EXCHANGE Any
CABLE COUNT 576-600 CABLE 1

MAP LINES R4-8 EXCHANGE Any
CABLE COUNT 551-575 CABLE 1



EXAMPLE: ASSUME THE HOUSING CAN ACCOMMODATE 3 COLUMNS (FRAME 1, 2, 3) AND 18 ROWS (BLOCK 1, 2, 18) OF MODULES. EACH MODULE CAN ACCOMMODATE 25 PAIRS (BINDING POSTS) OF CONDUCTORS. PAIR NUMBER 67 WOULD APPEAR AT THE FOLLOWING ADDRESS: FRAME 1 - BLOCK 3 - BINDING POST 17, OR 1-3-17.

SAI FEEDER RECORD

CK	BLOCK 1 - FEEDER										BLOCK 2 - FEEDER										BLOCK 3 - FEEDER										BLOCK 4 - FEEDER									
	B	L	P	XTO	XTO	XTO	XTO	XTO	XTO	XTO	CA	B	L	P	XTO	XTO	XTO	XTO	XTO	XTO	CA	B	L	P	XTO	XTO	XTO	XTO	XTO	CA	B	L	P	XTO	XTO	XTO	XTO	XTO		
1	8	1-7-19									526										551									576										
2		1-8-6									527										552									577										
3		1-11-1									528										553									578										
4		1-10-7									529										554									579										
5		1-10-14									530										555									580										
6		1-7-7									531										556									581										
7		1-13-1	5751								532										557									582										
8											533										558									583										
9											534										559									584										
10											535										560									585										
11											536										561									586										
12											537										562									587										
13											538										563									588										
14											539										564									589										
15											540										565									590										
16											541										566									591										
17											542										567									592										
18											543										568									593										
19											544										569									594										
20											545										570									595										
21											546										571									596										
22											547										572									597										
23											548										573									598										
24											549										574									599										
25											550										575									600										

EXCHANGE Any SAI NO X FEEDER CABLE AND COUNT 1,501-550 CABLE

EXCHANGE Any SAI NO X FEEDER CABLE AND COUNT 1,551-600 CABLE

EXHIBIT E REA TE&CM 118

CABLE										CABLE									
S.A.I. NO					S.A.I. NO					S.A.I. NO					S.A.I. NO				
EXCHANGE					EXCHANGE					EXCHANGE					EXCHANGE				
CA	B	L	XTO	CA	CA	B	L	XTO	CA	CA	B	L	XTO	CA	CA	B	L	XTO	CA
PAIR	P	P	DIST BP	PAIR	PAIR	P	P	DIST BP	PAIR	PAIR	P	P	DIST BP	PAIR	PAIR	P	P	DIST BP	PAIR
XTO	XTO	XTO	XTO	XTO	XTO	XTO	XTO	XTO	XTO	XTO	XTO	XTO	XTO	XTO	XTO	XTO	XTO	XTO	XTO
CONC	CARRIER	CARRIER	CARRIER	CONC	CONC	CARRIER	CARRIER	CONC	CONC	CONC	CARRIER	CARRIER	CONC	CONC	CONC	CARRIER	CARRIER	CONC	CONC
01				26					51					76					
02				27					52					77					
03				28					53					78					
04				29					54					79					
05				30					55					80					
06				31					56					81					
07				32					57					82					
08				33					58					83					
09				34					59					84					
10				35					60					85					
11				36					61					86					
12				37					62					87					
13				38					63					88					
14				39					64					89					
5				40					65					90					
6				41					66					91					
7				42					67					92					
8				43					68					93					
9				44					69					94					
				45					70					95					
				46					71					96					
				47					72					97					
				48					73					98					
				49					74					99					
				50					75					00					

- DISTRIBUTION -

DR BP	CA & COUNT	B P	CUSTOMER NAME	ROUTE	MAP NO.	PED. OR POLE NO.	TEL. NO.	L P	B O. CAP.	CARRIER SYSTEM CHANNEL
	/01	1								
	/02	2								
	/03	3								
	/04	4								
	/05	5								
	/06	6								
	/07	7								
	/08	8								
	/09	9								
	/10	10								
	/11	11								
	/12	12								
	/13	13								
	/14	14								
	/15	15								
	/16	16								
	/17	17								
	/18	18								
	/19	19								
	/20	20								
	/21	21								
	/22	22								
	/23	23								
	/24	24								
	/25	25								

21562

FRAME & BLOCK

DIST. CABLE & COUNT

7X, 101-125

EXCHANGE

EXHIBIT F

Sheet 1 of 1

1-6

DIST CABLE & COUNT *DX1, 126-150*

EXCHANGE

DIST CABLE & COUNT

[illegible]

- DISTRIBUTION -

FDR BP	CABLE COUNT	B P	CUSTOMER NAME	ROUTE	MAP NO	FED. OR POLE NO.	TEL NO.	L P	B. O. CAP.	CARRIER SYSTEM CHANNEL
	151	1								
	152	2								
	153	3								
	154	4								
	155	5								
	156	6								
-1-6	157	7	Stan Williams	1-4	5-105	425	5446	1		
	158	8								
Note that pair 157 is jumped to the feeder binding post at the following address:										
FRAME 1 BLOCK 1 B, POST 6										
	162	12								
	163	13								
	164	14								
	165	15								
	166	16								
	167	17								
	168	18								
1-1-1	169	19	John Doe	1-4-5	6-10	421	5411	1		
	170	20								
	171	21								
	172	22								
	173	23								
	174	24								
	175	25								

- DISTRIBUTION -

DR BP	CA & COUNT	B P	CUSTOMER NAME	ROUTE	MAP NO.	PED. OR POLE NO.	TEL. NO.	L P	B.O. CAP.	CARRIER SYSTEM CHANNEL
	201	1								
	202	2								
	203	3								
	204	4								
	205	5								
	206	6								
	207	7								
	208	8								
	209	9								
	210	10								
	211	11								
	212	12								
	213	13								
	214	14								
	215	15								
	216	16								
	217	17								
	218	18								
	219	19								
	220	20								
	221	21								
	222	22								
	223	23								
	224	24								
	225	25								

- DISTRIBUTION -

J FDR BP	CL & COUNT	B P	CUSTOMER NAME	ROUTE	MAP NO.	PED. OR POLE NO.	TEL. NO.	L P	B.O. CAP.	CARRIER SYSTEM CHANNEL
-1-3	251	1	Jim Smith	1	5-32	74	5401	--		
-13-2	252	2	Clyde Brooks	1	4-11	171	5474			
	253	3								
	254	4								
	255	5								
	256	6								
	257	7								
	258	8								
	259	9								
	260	10								
	261	11								
	262	12								
	263	13								
	264	14								
	265	15								
	266	16								
	267	17								
	268	18								
	269	19								
	270	20								
	271	21								
	272	22								
	273	23								
	274	24								
	275	25								

OFFICE			LINE EQUIPMENT RECORD										GROUP	
10		20	30	40	50	60	70	80	90		00	1A		
19	R1	29	39	49	59	69	79	89	99		09			
5401														
18		28	38	48	58	68	R1	78	88	98	08			
						5455								
17		27	37	47	57	67	77	87	97		07			
16		26	36	46	R1	56	66	76	86	96	06			
				5416										
15		25	35	45	55	65	75	85	95		05			
14	R1	24	34	44	54	R1	64	74	R1	84	94	04		
5454					5446			5488						
								LLE						
13		23	33	43	53	63	R1	73	83	93	03			
						5481								
12		22	R1	32	42	52	62	72	82	92	R1	02		
		5484								5495				
11	R1	21	31	41	51	R1	61	71	81	R1	91	01		
5411					5474				5481					
NOTES: PROPOSED					NO.		SERVED					X1578 NO.		
FR - FARM RES														
UR - URBAN RES														
RB - RURAL BUS.														
UB - URBAN BUS.														
OTHER														
REA TE&CM 118							EXHIBIT G							

OFFICE

TERMINAL RECORD

GROUP

54XX

10	20	30	40	50	60	70	80	90	00
19	29	39	49	59	69	79	89	99	09
18	28	38	48	58	68	78	88 RI	98	08
							1A-74		
							LLE		
17	27	37	47	57	67	77	87	97	07
16 RI	26	36	46 RI	56	66	76	86	96	06
1A-46			1A-54						
15	25	35	45	55 RI	65	75	85	95 RI	05
				1A-68				1A-92	
14	24	34	44	54 RI	64	74 RI	84 RI	94	04
				1A-14		1A-51	1A-22		
13	23	33	43	53	63	73	83	93	03
12	22	32	42	52	62	72	82	92	02
11 RI	21	31	41	51	61	71	81 RI	91	01 RI
1A-11							1A-81		1A-19

SERVED

NO.

EQUIPMENT

X1529

NO.

FR - FARM RES.

WIRED-----

UR - URBAN RES.

EQUIPPED-----

RB - RURAL BUS.

UB - URBAN BUS.

OTHER

[illegible]

SERVICE ORDER PLANT

ORDER NO. **9-77-1**
TYPE SER. ORDER **Install**
TEL. NO. **5411**

DATE ISSUED
8/30/77

DUE DATE
9/6/77

EXCHANGE
Any

-IN-

-OUT-

DIRECTORY NAME
John Doe

DIRECTORY NAME

DIRECTORY ADDRESS
RRI Anytown, USA

DIRECTORY ADDRESS

BILLING ADDRESS
Same

BILLING ADDRESS

CLASSIFIED LISTING

CLASSIFIED LISTING

EXTRA BUS.
LISTING RES.

EXTRA BUS.
LISTING RES.

SERVICE & EQUIP. -IN-

RATE

SERVICE & EQUIP. -OUT-

RATE

R1 - Yellow wall phone

MILEAGE OR ZONE CHARGE

MILEAGE OR ZONE CHARGE

TOTAL

TOTAL

REMARKS

PLANT INFORMATION

STAKING SH. NO. _____ DETAIL MAP NO. **13 Sub. Na 6-10** TAX DIST _____

MDF CABLE _____ PAIR _____ SAI **X** CABLE ADDRESS **1**

DIST. CABLE TERMINAL _____ PAIR **169** CABLE ADDRESS **1**

DIST. LINE OR ROUTE **1-4-5** PED OR POLE NO. **421**

PARTY POS (FREQ) **1** LINE FINDER **1A-11** GO TE _____

BUNCHING BLOCK NO. _____ BOOSTER ☐ YES BATT. ☐ NO

BRIDGED ☐ YES TAP ISOLATOR ☐ NO OTHER: _____

EFFECT. DATE _____ DATE PASSED _____ COMPLETED BY: _____

Any
 Comb.
 TYPE LE & VFR

PREFIX 266

EXCHANGE

PREFIX

TYPE

LINE TREATMENT

LINE FINDER	CONN. TERM.	CABLE PAIR	CARD NO.	LINE FINDER	CONN. TERM.	CABLE PAIR	CARD NO.	LINE FINDER	CONN. TERM.	CABLE PAIR	CARD NO.	LINE FINDER	CONN. TERM.	CABLE PAIR	CARD NO.
			26				51				76				
			27				52				77				
			28				53				78				
			29				54				79				
			30				55				80				
1A74	5488	505	31				56				81				
			32				57				82				
			33				58				83				
			34				59				84				
			35				60				85				
			36				61				86				
			37				62				87				
			38				63				88				
			39				64				89				
			40				65				90				
			41				66				91				
			42				67				92				
			43				68				93				
			44				69				94				
			45				70				95				
							71				96				
							72				97				
							73				98				
							74				99				
							75				100				

EXCM 118

EXHIBIT L

EXCHANGE

PREFIX

TYPE

EXCHANGE

LINE TREATMENT

PREFIX

TYPE

CARD NO	LINE FINDER	CONN TERM.	CABLE PAIR	CARD NO	LINE FINDER	CONN TERM.	CABLE PAIR	CARD NO	LINE FINDER	CONN TERM.	CABLE PAIR	CARD NO	LINE FINDER	CONN TERM.	CABLE PAIR
1				26				51				76			
2				27				52				77			
3				28				53				78			
4				29				54				79			
5				30				55				80			
6				31				56				81			
7				32				57				82			
8				33				58				83			
9				34				59				84			
10				35				60				85			
11				36				61				86			
12				37				62				87			
13				38				63				88			
14				39				64				89			
15				40				65				90			
16				41				66				91			
17				42				67				92			
18				43				68				93			
9				44				69				94			
0				45				70				95			
1				46				71				96			
2				47				72				97			
3				48				73				98			
4				49				74				99			
5				50				75				100			

CE

PREFIX

TYPE

EXCHANGE

PREFIX

TYPE

FIM

REA TE&CN 718

[illegible]

[illegible]

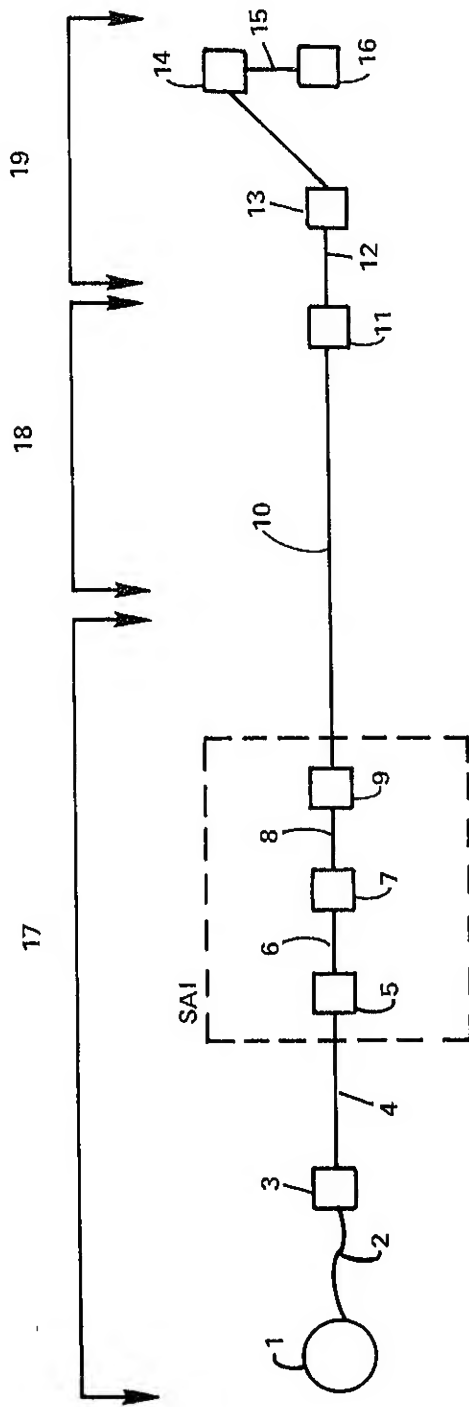
REA TE&CH 11S

PAGE 1 OF

[illegible]

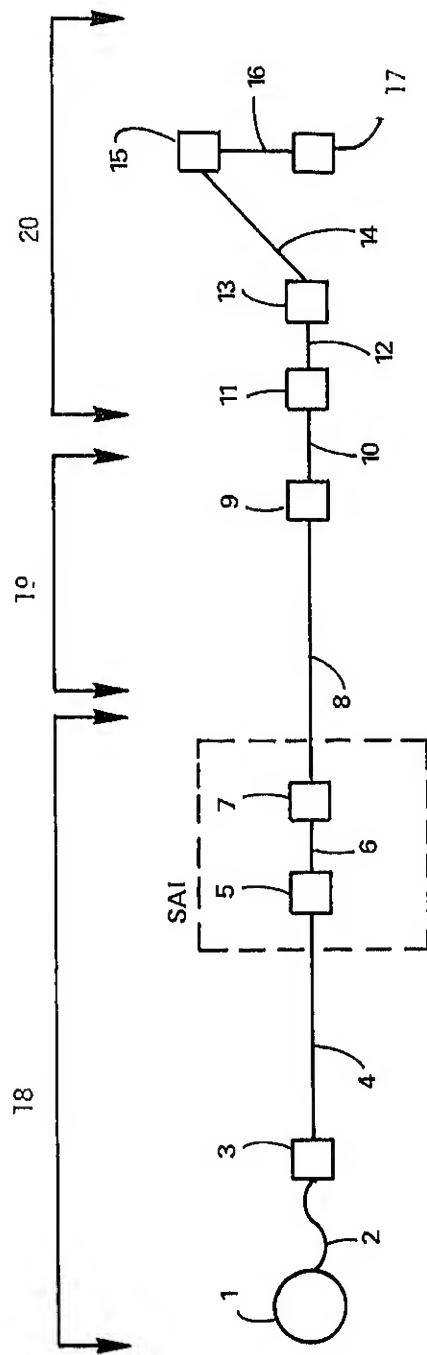
EXCHANGE Any PREFIX 266 EXCHANGE _____ PREFIX _____
CABLE COUNT DX1,101-300 CABLE COUNT _____
EXHIBIT M2

[illegible]



1. CUSTOMER
2. DROP
3. PEDESTAL
4. DISTRIBUTION CABLE
5. DISTRIBUTION CABLE BLOCK & BINDING POST (B.P.)
6. JUMPER
7. CARRIER/CONC. BLOCK & B.P.
8. JUMPER
9. FEEDER BLOCK & B.P.
10. FEEDER CABLE
11. MDF COUNT
12. JUMPER
13. CARRIER/CONC. OFFICE TERMINAL
14. LINE FINDER BLOCK & B.P.
15. JUMPER
16. CONNECTOR BLOCK & B.P.
17. RECORD ON SAI & SUPPLEMENTAL CXR/CONC RECORD
18. RECORD ON MDF CABLE RECORD
19. RECORD ON CO FACILITY RECORDS

BLOCK DIAGRAM - SYSTEM LAYOUT



- | | | |
|---|----------------------------|-----------------------------------|
| 1. CUSTOMER | 12. JUMPER | 18. RECORD ON SAI CABLE RECORD |
| 2. DROP | 13. VFR | 19. RECORD ON MDF CABLE RECORD |
| 3. PEDESTAL | 14. JUMPER | 20. RECORD ON CO FACILITY RECORDS |
| 4. DISTRIBUTION CABLE | 15. LINE FINDER | |
| 5. DISTRIBUTION CABLE BLOCK & BINDING POST (B.P.) | 16. JUMPER | |
| 6. JUMPER | 17. CONNECTOR BLOCK & D.P. | |
| 7. FEEDER BLOCK & B.P. | | |
| 8. FEEDER CABLE | | |
| 9. MDF COUNT | | |
| 10. UNMADE | | |

1EP.T.

IM - SYSTEM LAYOUT INCLUDING LINE TREATMENT